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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,443	03/23/2004	Poul Erik Hojlund Nielsen	H0610.0361/P361	1808
24998	7590	09/17/2004	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			PARSA, JAFAR F	
2101 L STREET NW			ART UNIT	
WASHINGTON, DC 20037-1526			PAPER NUMBER	
			1621	

DATE MAILED: 09/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/806,443

**Applicant(s)**

HOJLUND NIELSEN ET AL.

**Examiner**

Jafar Parsa

**Art Unit**

1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/13/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

The heading entitled "brief description of drawings" is required for a utility application under 37 CFR 1.77(b). Appropriate corrections is required.

Claims 2-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 2-4 recite the broad recitations 0-10 wt % water, 50-290 bar pressure in the slurry bed and 150-240 °C temperature in the slurry bed, and the claims also recite 0-3 wt% water, 60-140 bar

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pressure in the slurry bed and 180-225 °C temperature in the slurry bed which are the narrower statement of the ranges/limitations.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Tierney et al (USPN 5,384,335).

Tierney discloses a process for preparing methanol by contacting synthesis gas under relatively mild conditions in a slurry phase in the presence of a methanol synthesis catalyst at a temperature range of 100-160 °C and pressure range of 40-65 atmosphere. The only major by-product is a small amount of easily separated methyl formate. Very small amount of water, carbon dioxide and dimethyl ether are also produced. Carbon dioxide and water are also tolerated without substantial catalyst deactivation (see abstract).

Tierney discloses that the methanol synthesis reaction is very exothermic. Poor heat transfer in the in the methanol synthesis reactor results in an outlet methanol concentration limited to 5-6%. Either cool unreacted synthesis gas injected in the methanol synthesis reactor or internal cooling surfaces is generally used to control the bed temperature (col. 2, lines 40-45).

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Tierney teaches that synthesis gas having an inlet composition of 66.6% hydrogen, 33.3 % carbon monoxide and 0.1 % carbon dioxide was fed to an autoclave charged with a methanol synthesis catalyst and 150 cc methanol the reactor was pressurized to 910 psig and temperature was adjusted to 150 0C. A liquid composition of 95.6% methanol, 4% methyl formate, 0.3% water and trace of dimethyl ether and dissolved gases was obtained (see example 10). The molar ratio of carbon dioxide to carbon monoxide and hydrogen to carbon monoxide read on the molar ratios of carbon dioxide to carbon monoxide and hydrogen to carbon monoxide disclosed in Example 10.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tierney (USPN 5,384,335) as applied to claims 1-9 above, and further in view of Konig et al.

Applicants' claimed invention is directed to process for methanol production in a liquid phase reactor from a synthesis gas comprising of hydrogen, carbon dioxide and carbon monoxide. The liquid phase reactor contains a solid catalyst suspended in methanol. In this process, methanol acts both as a product and as a suspension medium for the catalyst. The reacting synthesis gas is cooled by internal cooling means and stream comprising methanol and at least one of the compounds of methyl formate, ethanol is recycled to the reactor.

Tierney discloses a process for preparing methanol by contacting synthesis gas under relatively mild conditions in a slurry phase in the presence of a methanol synthesis catalyst at a temperature range of 100-160 °C and pressure range of 40-65 atmosphere. The only major by-product is a small amount of easily separated methyl formate. Very small amount of water, carbon dioxide and dimethyl ether are also produced. Carbon dioxide and water are also tolerated without substantial catalyst deactivation (see abstract).

Tierney discloses that the methanol synthesis reaction is very exothermic. Poor heat transfer in the in the methanol synthesis reactor results in an outlet methanol concentration limited to 5-6%. Either cool unreacted synthesis gas injected in the methanol synthesis reactor or internal cooling surfaces is generally used to control the bed temperature (col. 2, lines 40-45).

Tierney teaches that synthesis gas having an inlet composition of 66.6% hydrogen, 33.3 % carbon monoxide and 0.1 % carbon dioxide was fed to an autoclave charged with a methanol synthesis catalyst and 150 cc methanol the reactor was

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pressurized to 910 psig and temperature was adjusted to 150 0C. A liquid composition of 95.6% methanol, 4% methyl formate, 0.3% water and trace of dimethyl ether and dissolved gases was obtained (see example 10). The molar ratio of carbon dioxide to carbon monoxide and hydrogen to carbon monoxide read on the molar ratios of carbon dioxide to carbon monoxide and hydrogen to carbon monoxide disclosed in Example 10.

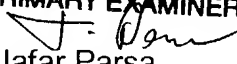
The difference between Tierney and claimed invention is that the Tierney reference does not teach recycling a stream comprising methanol and at least one compounds of methyl formate, ethanol is recycled to the reactor. However, Konig teaches a process for production of methanol from hydrogen, carbon monoxide and carbon dioxide where a fraction of a by-product comprises 10-100% by weight methyl formate is recycled to the methanol synthesis reaction. Konig teaches that methyl formate separated from the condensate contains water, methanol and methyl formate and said fraction is mixed with the synthesis gas, which is fed to the synthesis reactor. As a result, the methyl formate is hydrogenated over the catalyst in the synthesis reactor to the increase the production of methanol (see col. 1, lines 25-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to recycle a stream comprising methanol and at least one of the compounds of methyl formate, ethanol to the methanol synthesis reactor to increase the production of methanol.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jafar Parsa whose telephone number is (571)272-0643. The examiner can normally be reached on 8 a.m.-4:30 p.m. (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on (571)272-0646. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**J. PARSA**  
**PRIMARY EXAMINER**  
  
Jafar Parsa  
Primary Examiner  
Art Unit 1621

9/15/04

JP